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STUDENT REPORT
GROUND-BASED THREAT TO NUCLEAR
LOGISTICS AIRCRAFT DURING
LOW-ALTITUDE FLIGHT

MAJOR ALLEN D. BAKER

88-0165

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DURING LOW-ALTITUDE FLIGHT

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Submitted to the faculty in partial fulfillment of
requirements for graduation.

AIR COMMAND AND STAFF COLLEGE
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PREFACE

The United States Air Force Military Airlift Command is responsible for the non-combat logistics movement of nuclear weapons on prime nuclear airlift force (PNAF) aircraft. PNAF aircraft are protected on the ground by security forces from time of touchdown to takeoff. However, in low-altitude flight the aircraft is vulnerable to small hand-held antiaircraft rockets and missiles.

This project, sponsored by the Defense Nuclear Agency, investigated the threat to PNAF aircraft from small hand-held rockets and missiles during low-altitude flight. The resulting evaluations determined a credible threat to PNAF aircraft and outlined practical countermeasures to prevent, deter, and respond to the threat.

Hopefully, units in Western Europe will write comprehensive plans to prevent, deter, and respond to the threat. Moreover, units in high threat areas need the resources to preempt terrorist attacks. Finally, more investigation and evaluation needs to be done regarding the military role in preemptive actions against terrorists.

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REPORT NUMBER 88-0165

AUTHOR(S) MAJOR ALLEN D. BAKER, USAF

TITLE GROUND-BASED THREAT TO NUCLEAR LOGISTICS AIRCRAFT
DURING LOW-ALTITUDE FLIGHT

The purpose of this report is to

I. Purpose: To evaluate and counter the possible terrorist threat of using a small hand-held rocket or missile against a prime nuclear airlift force (PNAF) aircraft during low-altitude flight in Western Europe. — p. VII

II. Problem: PNAF aircraft are vulnerable to a rocket or missile attack during approach and takeoff. However, what is the threat in terms of terrorist's weapons and capabilities? Should the military be concerned? What practical methods can counter the threat?

III. PNAF Mission Profiles/Differences: If terrorists can identify their target the likelihood of a successful attack against an actual PNAF mission is increased. No exploitable differences exist between PNAF and non-PNAF mission profiles. However, the distinctive ground signature of PNAF aircraft provide visual clues to terrorists. The visible ground security measures for departing PNAF missions make target identification simple.

CONTINUED

IV. Terrorists' Motives, Weapons, and Capabilities: The Red Army Faction (RAF), a West German left-wing revolutionary terrorist group is motivated towards ridding Western Europe of NATO and especially American military presence. They are linked to Arab terrorist states for training, weapons, and funding. The RAF have demonstrated use of small hand-held rockets. Other left-wing revolutionary terrorists have been captured with small hand-held missiles. The terrorists' motives, weapons, and demonstrated use pose a significant threat to PNAF aircraft.

V. Threat Evaluation: Determination of this threat as credible is based on four criteria: known vulnerability, advantageous exploitation, obtainable technology, and cost effectiveness. Terrorists are aware of an aircraft's vulnerability to rockets and missiles during low-altitude flight. They are motivated to attack military targets in Western Europe. Terrorists, through their links with Arab terrorist states can obtain these weapons. Finally, terrorists view such an attack as financially and psychologically cost effective. (SIC) *af*

fig VI VI. Countermeasures: Countermeasures are designed to prevent, deter, and respond to a terrorist attack. They are based on national level policies reflecting our concern of the threat. The areas of intelligence, deception, technology, and tailored unit plans play the key roles in providing practical countermeasures. Unit commanders in areas of high terrorist threat need the resources to covertly find terrorists to preempt attacks. Deception of terrorists is essential in preventing attacks. Commanders must protect PNAF mission information and act to disorient terrorists attempting to collect information. Technology can help protect against the threat from radar and infrared-guided missiles, reduce the numbers of smuggled weapons into Western Europe, and minimize the risk of possible nuclear contamination resulting from a PNAF aircraft crash. Finally, units must develop specific plans to prevent, deter, and respond to terrorist attacks against PNAF aircraft.

Chapter One

INTRODUCTION

PURPOSE STATEMENT

Is there a credible threat against prime nuclear airlift force (PNAF) aircraft in Western Europe from the use of a small hand-held anti-aircraft rocket or missile by a terrorist group, during low-altitude flight (approach and takeoff) and if so, what are the countermeasures?

SIGNIFICANCE

This research project, sponsored by the Defense Nuclear Agency, will address the threat, the concern, and methods to counter a terrorist attack against U.S. Air Force Military Airlift Command logistical aircraft transporting nuclear cargo -- PNAF aircraft. Nuclear cargo consists of "nuclear weapons, nuclear warheads, and Class II components containing active material" (18:1). Terrorists pose a significant threat to airlift aircraft.

According to the U.S. Air Force Military Airlift Command, "terrorists and dissident groups, using small arms and even missiles pose a very dangerous and lethal threat to aircraft during the takeoff and landing phase of flight" (23:8). Further, Air Force policy states: "Nuclear weapons must be specially secured because of their political and military importance, destructive power, and cost, and because of the consequences of an unauthorized or accidental detonation. They must be secured against all risks and threat" (18:1).

BACKGROUND

World-wide terrorist incidents are increasing annually 10% to 12% (12:8). The sheer number of international terrorist incidents is astounding. For example, 610 major terrorist incidents were reported during the first quarter 1987 and 761 were reported during April through June 1987 (16:20). To understand this growth in incidents we must first understand what terrorism is.

Although there is no single internationally accepted definition, the Vice President's Task Force on combating terrorism defined it as, "the unlawful use or threat of violence against persons or property to further political or social objectives. It is generally intended to intimidate or coerce a government, individuals or groups to modify their behavior or policies" (24:1). By this definition, terrorists literally have an unlimited range of targets.

Normally, they select soft or undefended targets having representative or symbolic value (12:11). Ninety-five percent of all terrorist incidents include bombings, assassinations, armed assaults, kidnappings, hijackings, and barricade and hostage incidents (12:11). The terrorist success rate against these targets in 1985 was 92% with 25.6% occurring in Western Europe (14:98; 24:3). Not only are the vital statistics concerning terrorist actions disconcerting, but so are their future trends.

These trends include the use of technologically advanced weapons - mortars, rockets, rocket-propelled grenades, and precision-guided munitions (12:11). Additionally, terrorism is becoming institutionalized with international cooperation among terrorist groups. Terrorist groups have received money, training, weapons, and men from other terrorist organizations (9:214; 17:45). For example, the West German Red Army Faction (RAF) recently joined forces with the French Direct Action (DA) to establish the Political-Military Front (PMF). The PMF's objectives threaten NATO military installations and personnel and NATO arms contracts (27:17).

We have seen through the media or experienced first-hand the sting of terrorism. Indeed, 78% of all Americans consider terrorism as a serious threat to the U.S. Government (24:17). The public concern over the terrorist threat is costly. In the United States, \$21 billion is privately spent annually for security services and hardware (12:12). Therefore, before the military uses resources to counter the terrorist threat against PNAF aircraft several basic questions must be answered. What is the threat? Should we be concerned? What reasonable methods can we use to counter the threat?

To answer these questions, I'll first describe current PNAF aircraft mission profiles in Western Europe to determine if any exploitable differences or signatures exist between PNAF and other missions. Second, I'll identify the potential threat groups and their known capabilities to successfully attack a PNAF aircraft. Third, I'll evaluate the threat to PNAF aircraft based on four key threat criteria. Finally, I'll evaluate possible methods to counter the threat based on the prior threat evaluation.

Chapter Two

PNAF MISSION PROFILES/DIFFERENCES

This chapter investigates the current PNAF aircraft and mission profiles. The objective is to determine if any exploitable differences exist between PNAF missions and other missions using the same aircraft. These differences, if exploited by terrorists, could lead to target identification. Indeed, the United States Air Force Military Airlift Command (MAC) recognizes the threat to any MAC aircraft during low-altitude flight. However, can terrorist groups identify a PNAF mission among the other MAC aircraft missions?

AIRCRAFT TYPES AND CREWS

The PNAF uses active duty C-130 and C-141 aircraft. Aircrews are specially trained and qualified (22:9). These aircraft and aircrews accomplish the PNAF mission.

MISSION PROFILE

A PNAF mission profile includes scheduling, command and control, arrival and departure, and enroute. Enroute is the high-altitude portion of flight prior to and after transitioning from low-altitude arrival and departure flight. Since the threat is focused on the ground based threat during low-altitude flight, the enroute mission profile will not be covered.

Scheduling

There are two phases in scheduling; the request and the mission setup. First, Air Force Major Commands request nuclear cargo shipments monthly in the nuclear ordnances shipping schedule (NOSS). The NOSS reflects each commands' airlift needs in advance and forecasts requirements for the next 30 to 60 days. The NOSS is sent as a classified message to:

San Antonio Air Logistics Center, Kelly AFB, Texas; Director of Special Weapons, Kelly AFB, Texas; HQ Air Force (Deputy Chief of Staff Logistics and Engineering) LEYW, Washington D.C.; Air Force Logistics Command, Wright-Patterson AFB, Ohio; HQ Military Airlift Command, Scott AFB, Illinois; Director of Nuclear Surety, Kirtland AFB, New Mexico (18:3).

During the second phase of scheduling the airlift unit details the mission itinerary to the receiving unit with a classified mission setup message (22:7).

Command and Control

The difference between scheduling and command and control is information content and timing. Scheduling is mission planning and programming information prior to flight, and command and control is mission coordinating information during flight. The command and control information of interest is the conversations via insecure radio between PNAF crews and receiving units 30 minutes prior to landing. Under normal circumstances the PNAF crew passes the "special assignment airlift mission (SAAM) number, verifies hazardous cargo (mission setup message received), and requests ETA (estimated time of arrival) be passed to support agencies" (22:30).

Arrival and Departure

Arrival and departure is defined as the low-altitude phase of flight. It is during this phase of flight that aircraft are most vulnerable to terrorist attacks using small arms and missiles (23:8).

DISTINGUISHABLE DIFFERENCES

The significance of this section lies in the terrorists' ability to properly identify the target. If the terrorist can identify the target then the probability of a successful attack is increased. While, the indiscriminate attack on any C-130 or C-141 might result in destroying a PNAF aircraft, the probability is lower. Therefore, any distinguishable differences which are exploitable between PNAF and other missions will increase the terrorists' success rate.

First, aircraft types and crew qualifications provide no exploitable differences. Although PNAF crew qualification results in flagged military medical/dental records under the personnel reliability program and documentation in writing by

the squadron commander, the ability to link individual crewmembers to PNAF aircraft arrival in Western Europe is unlikely (22:9). Linkage would require a coordinated, real-time intelligence effort between terrorists in Europe and the United States. Further, knowing C-130 and C-141 aircraft can carry nuclear cargo does nothing to specifically identify a PNAF mission. However, other PNAF mission profiles can provide the terrorists with identifiable differences.

These mission profiles include scheduling, command and control, and arrival and departure. Scheduling and command and control contain elements of information, which if compromised, could identify a particular PNAF mission. For example, the NOSS and mission setup messages are classified because specific nuclear cargo, unit, and mission information is identified. Therefore, communications and operational security procedures are stressed to help secure this valuable information (22:29). Yet, "coordination of support requirements by secure means is encouraged but not demanded" (22:7). If communications and operational security procedures are followed, the ability to exploit scheduling and command and control information is denied. However, radio communications resulting from a missed mission (i.e., receiving unit unaware of a PNAF arrival) reveals significant information, including; aircraft type, explosives on-board, hazard class, special handling and security required (22:30).

Next, the low-altitude flight for C-130 and C-141 aircraft is no different for PNAF missions and other C-130 and C-141 missions. Flight paths and patterns do not reveal mission information. However, the receiving unit's ground signature prior to and after a PNAF mission arrival provides a distinguishable difference between missions. The major differences stem from security force activities and aircraft parking locations (22:41-42). These visual signatures make target identification simple, particularly for departing PNAF aircraft with nuclear cargo. The next chapter will discuss terrorist group motives, weapons, and capabilities--important criteria in threat evaluation.

Chapter Three

TERRORISTS' MOTIVES, WEAPONS, AND CAPABILITIES

This chapter discusses several questions concerning the potential threat of a terrorist attack directed against a low-altitude PNAF aircraft. What motivates terrorist acts? Which hand-held rockets/missiles pose a threat? Are terrorists capable? The examination of these questions provide the background information to evaluate the potential threat in Chapter 4. Yet, obtaining detailed information to identify groups is difficult since specific data is fragmented (10:60). Nevertheless, we can categorize terrorist motives by their behavior (5:22).

MOTIVES

Terrorist behavior is not mindless violence but planned use of force to obtain objectives (6:1). Terrorists use of force is a criminal act but they perceive themselves as soldiers (6:3). Therefore, the terrorists' perception of their behavior is an important aspect in understanding their motives (6:5). Two broad categories of terrorist motives emerge from their behavior; repressive and revolutionary. Repressive terrorists are state actors motivated to sustain the current state's authority. Revolutionary terrorists are motivated to overthrow the current government. Additionally, revolutionary terrorists are divided among four groups; left-wing, right-wing, nationalist/separatists, and individuals (5:22-24).

The terrorists of most interest are the left-wing revolutionary groups operating in Western Europe. These groups are motivated to overthrow what they perceive as unjust and repressive governments. Currently, two terrorist groups, the German Red Army Faction (RAF) and the French Action Direct (AD) use violence to combat "the materialism and repression of Western Society" (5:23). For example, the RAF aim is to rid West Germany of American military presence. Their methods include bombings, bank robberies, assassinations, and sabotage (28:24). "The RAF are usually regarded as the most violent and effective of the West German terror groups" (5:248). Additionally, terrorism as a method used in low-intensity warfare or conflict has become international. The trend is towards increased state-

sponsored terrorism. Indeed, the RAF, the AD and left-wing Palestine organizations have operated together (17:214). "The state-sponsorship of these terrorist groups has escalated their use of force into the spectrum of low-intensity conflict" (17:214). For instance, the Libyan sponsorship of revolutionary terrorists has produced a capable terrorist (28:190). But before discussing terrorist capabilities, a brief review of the weapons that make them a threat follows.

WEAPONS

The weapons that pose a credible threat to low-altitude PNAF aircraft and are available to terrorists include hand-held rockets (RPG-7) and missiles (SA-7). The Soviet-built rocket-propelled grenade, RPG-7, is an anti-tank weapon with limited anti-aircraft capability. Characteristically, out to 500 meters the rocket has a consistent trajectory, but after rocket motor burnout or in high winds, the rocket heads into the wind and is blown down wind. The grenade fuse is piezo-electric requiring the nose to be crushed before producing a detonation. The RPG-7 uses a range finding optical sight (1:780-781). Thus, the operator must aim, lead, and consider wind direction and speed to hit a moving target. Therefore, the RPG-7 is less effective in an anti-aircraft employment than the SA-7.

The Soviet-built, shoulder-fired surface-to-air missile, SA-7 Grail, is a significant threat to low-altitude aircraft. The SA-7 uses initial optical aiming with infrared terminal homing. Speed is Mach 1.5. Operating range is 150 feet minimum and 9000 feet maximum. Range is two miles. It was used in the Vietnam War by the North Vietnamese and in the 1973 Arab-Israeli War by the Arab forces (7:45; 8:184).

Not only do these weapons pose a threat to PNAF aircraft, but the weapons are readily available. For example, Libya and the Soviet Union have supplied the Palestinians in Lebanon with SA-7s. "The Palestinians have no problems acquiring weapons and supplying them to any non-Arab organization with which they have close links" (4:143). In fact, the RAF has long standing links to Palestinian terrorists (5:248). During 1968-1970, the RAF were trained by the Popular Front for the Liberation of Palestine (PFLP) in Jordan, and the RAF currently uses the Middle East as a safe haven (4:143). RAF links to Palestinian terrorists have resulted in the RAFs demonstrated capability to use these weapons.

CAPABILITIES

Capability equals weapon availability and use. As previously discussed, small hand-held rockets and missiles are available. For instance, Libya funds and trains revolutionary terrorists and supplies them with these weapons (28:190-192). Indeed, the RAF has demonstrated the use of the RPG-7 in the September 1981 attack against General Kroesen, Commander US Army Forces in Europe (28:28). Further, "in 1973 an Arab terrorist group armed with a SA-7 was picked up in Rome, and in 1975 the terrorist group, Black September, attacked an El Al aircraft at Orly Airport in Paris with a RPG-7" (5:27). The need to demonstrate weapons use lies in the threshold concept. "Whatever the probability of it [use of a SA-7] happening the first time, once it is done, there is a higher probability of groups trying to imitate such an act, claiming-with increased credibility-to have such capabilities" (4:151).

Terrorist's use of force to obtain stated objectives combined with their demonstrated capabilities does not necessarily predict specific future acts. If they did, then we would know the terrorist's next target. However, an attack directed specifically against a PNAF aircraft is a significant psychological increase in violence, considering the public reaction to a real or perceived radioactive contamination. "Indeed, evidence shows that Italy's Red Brigade and the West German RAF have discussed the nuclear option as one way of escalating terrorist pressure" (2:160). The following chapter will evaluate the terrorist threat against a PNAF aircraft.

Chapter Four

THREAT EVALUATION

Admiral Stansfield Turner, serving as Director of Central Intelligence, told Congress about the threat to airlift forces: "One important aspect of the terrorist threat has not yet been given the emphasis it deserves. The Military Airlift Command--the free world's only effective military airlift force--is particularly vulnerable to terrorist attack" (15:4). This chapter will evaluate the threat to low-altitude PNAF aircraft by outlining four key threat criteria, describing a plausible threat scenario, and evaluation of the threat scenario. Evaluating a credible threat requires a balanced approach based on several factors. An evaluation focusing solely on terrorist intentions, lacking specific data concerning the target and the terrorist capabilities, can lead to an overreaction of the assumed threat (19:2-1).

CRITERIA

A threat is credible based on the "evaluation of the mission of the base; versus intentions and capabilities of hostile elements" (19:2-1). Therefore, a threat is credible if it meets these four criteria; first, a vulnerability exists and it is known by the terrorist; second, the terrorist views exploitation of the vulnerability as an advantage; third, the terrorist has or can obtain the support to exploit the vulnerability and; fourth, the terrorist views exploitation as cost effective. To comprehend how these criteria are satisfied in a credible threat against a PNAF aircraft, I'll describe a plausible terrorist scenario and then evaluate it against the criteria.

SCENARIO

This fictitious scenario outlines a successful terrorist attack against a low-altitude PNAF aircraft using small hand-held missiles. The terrorist attack occurs in the Federal Republic of Germany near a NATO air base. The destroyed PNAF aircraft was returning to the United States with several nuclear weapons requiring depot actions. The SA-7 missile

attack occurred approximately one mile off base. Local police discovered a spent SA-7 launcher in the woods, near the base after the crash. The C-141 aircraft exploded on impact, spreading fire and debris over a large area. The nuclear weapons were involved in the aircraft fire but were recovered intact. The terrorists reported the attack to the international press. They claimed responsibility for destruction of nuclear weapons on an American military airplane. The terrorist's aim was to demonstrate their resolve to rid Europe of American soldiers and nuclear weapons. Further, the left-wing German terrorist group claiming responsibility openly thanked their Islamic brothers for all their assistance in accomplishing the mission. This scenario represents one of many possible terrorist attacks. However, to determine the credibility of this scenario requires evaluation of known factual information applied to key threat criteria.

EVALUATION

Known Vulnerability

The vulnerability of low-altitude aircraft to small hand-held missiles is an accepted fact (15:4; 23:8). Additionally, based on terrorist training and open source information concerning missile attacks, terrorists know this vulnerability. However, the terrorists' ability to identify the target is more difficult. From the discussion in Chapter 2, PNAF mission profiles provide little, if any, distinguishable differences exploitable by terrorists for target identification. Yet, the visual ground based security activities provide exploitable mission differences. These ground activities make target identification easier for departing PNAF missions. Therefore, the scenario depicted an attack against a PNAF aircraft returning to the U.S.

Advantageous Exploitation

The credibility of a threat is further increased if the terrorists perceive an advantage to the attack. In the scenario, the terrorist objective was to discredit NATO and US military forces by demonstrating the vulnerability of NATO nuclear forces. "All they [the terrorists] have to do is establish some credibility through an incident or something involving our nuclear sites, which the media would then build up and which would cause mass hysteria" (3:68). The terrorist's overall success and risk in this operation is high (3:69; 14:98).

Obtainable Technology

Although the intentions of the terrorist are important, threat evaluation must "stress known capabilities of terrorists to damage and destroy. If precise information about [a terrorist group's] capabilities is not available, the assessment must be based on reason and logic and should be relatively free of opinion" (19:2-1). Terrorist capabilities require equipment and support. Terrorist operations are achieved by an organized group and not an individual. The group is specially trained for the particular mission (14:96). Their equipment will include SA-7 missiles, rapid fire machine pistols and assault rifles (5:26). "The execution of their operation will be based on guerrilla warfare methods" (14:96). Support for the operation is provided by one or more common cause terrorist organizations or states. Monetary support can come from illegal operations. For example, the RAF have robbed thirty banks resulting in approximately \$3 million (DM 5.4 million) (4:63). External training and weapons support is provided by sympathetic terrorist states. Indeed, in 1976, Libya had a \$580 million fund for the training and arming of revolutionary terrorists (28:190-191). Libya's weapons include AK-47 rifles, RPG-7 rockets, and SA-7 missiles (28:190-192).

Cost Effective

Finally, threat evaluation must include a discussion of cost. Specifically, the terrorist group views the act as cost effective, both financially and psychologically. Terrorism in the spectrum of low-intensity warfare is cheap compared to more traditional conventional warfare (26:24). As previously mentioned, internal and external funding is obtainable. However, the psychological cost to the terrorist group is more difficult to determine.

One analysis suggests a distinction between terrorists operating on their own patch, and terrorists operating "trans-nationally". The "domestic" terrorist is susceptible to the opinions of the public he hopes to influence, and is therefore more selective in his targeting. The terrorist operating abroad, however, regards the shock and outrage of the foreign public as a "bonus", evidence that he has harmed the enemy, and is inclined to be more ruthless (5:234-235).

In general, the psychological cost is effective if the gain toward their objective is perceived to be greater than the loss of public opinion. Often terrorists do not fully

consider the psychological cost of their act because of a distorted group decision-making process characterized by the "groupthink" phenomenon. This phenomenon results in high risk decisions based on the "reduction of critical judgement, the assumption of the group's morality, and the illusion of invulnerability" (2:97).

There is a credible threat to PNAF aircraft. However, determining our concern about this threat is not clear. For instance, the threat to low-altitude PNAF aircraft by terrorists using a small hand-held missile is based on empirical data derived from related experiences and observations. Yet, the amount of concern to any situation is an individual evaluation based on one's interest and feelings. Therefore, we need to translate our concerns into specific policies regarding our actions towards combating terrorism. Then we must identify practical countermeasures based on these policies and threat. The last chapter will evaluate several practical countermeasures.

Chapter 5

COUNTERMEASURES

Our national leadership makes policy regarding responses to terrorism. Vice President Bush's Task Force on Combating Terrorism stated the following five U.S. policies towards terrorism:

The U.S. Government is opposed to domestic and international terrorism and is prepared to act in concert with other nations or unilaterally when necessary to prevent or respond to terrorist acts.

The U.S. Government considers the practice of terrorism by any person or group a potential threat to its national security and will resist the use of terrorism by all legal means available.

States that practice terrorism or actively support it will not do so without consequence. If there is evidence that a state is mounting or intends to conduct an act of terrorism against this country, the United States will take measures to protect its citizens, property and interests.

The U.S. Government will make no concessions to terrorists. It will not pay ransoms, release prisoners, change its policies or agree to other acts that might encourage additional terrorism. At the same time, the United States will use every available resource to gain the safe return of American citizens who are held hostage by terrorists.

The United States will act in a strong manner against terrorists without surrendering basic freedoms or endangering democratic principles, and encourage other governments to take similar stands (24:7).

Additionally, the U.S. Air Force made the following policy statements concerning the protection of nuclear weapons -- PNAF aircraft cargo:

Nuclear weapons must be specially secured because of their political and military importance, destructive power, and cost, and because of the consequences of an unauthorized or accidental detonation. They must be secured against all risks and threats (18:1).

Commanders who protect nuclear weapons must assess possible threats to nuclear weapons in storage, in maintenance, or in transit. Commanders must continually review the protection given nuclear weapons with current intelligence and other relevant factors (20:D-1).

In light of these policies and the threat against PNAF aircraft, there are practical countermeasures which can be implemented. These countermeasures include the role of intelligence, deception, technology, and unit plans to prevent, deter, and respond to this terrorist threat (6:12).

INTELLIGENCE

Sun Tzu, a general for the Chinese Kingdom of Wu in 500 B.C., wrote: "If you know the enemy and know yourself, you need not fear the result of a hundred battles. Knowledge of the enemy's dispositions can only be obtained from other men" (29:3,25). Sun Tzu's advice is still timely concerning the role of intelligence in countering terrorism.

Countering terrorism requires a knowledge and understanding of terrorists' plans, goals, methods, and operating bases (10:60). In fact, "intelligence support is an essential element of the PNAF mission" (22:49). Since the terrorist threat is dynamic, Air Force directives make the unit commander responsible for determining the local terrorist threat condition. The commander's determination is based on intelligence collected and analyzed by the local Office of Special Investigation (AFOSI), wing intelligence and plans, and base security police (19:2-2; 21:3).

Commanders of units in high risk terrorism areas should be given expanded intelligence resources capable of covert or special intelligence operations (14:99). Given the low-intensity warfare nature of terrorism, these operations should include preemptive offensive actions aimed at finding terrorists (6:57; 14:99). Vital to this intelligence effort is the cooperation with the host national intelligence agencies (14:99). Hence, AFOSI needs to collect, analyze, and disseminate terrorist information with host national intelligence agencies (21:3). Obtaining the detailed

data on terrorist threats is difficult. The information is fragmented and threat assessments are not infallible (10:60). Yet, full cooperation among intelligence agencies is essential to help counter terrorism. Understandably, the intelligence collected by terrorists is just as vital to their successful attack on a PNAF aircraft.

DECEPTION

The art of deceiving one's enemy is fundamental in countering a terrorist attack on a PNAF aircraft. Commanders can deceive terrorists by concealing essential mission information and conducting random operations. Commanders must control PNAF mission movement information (20:D-7). The most elaborate deception will fail if terrorists have prior mission knowledge. The unit's use of sound operational security procedures and communication security products is necessary to counter terrorists. As previously discussed, terrorists can identify a PNAF mission by the visible ground security defense signature for a departing PNAF aircraft. To help negate the ground signature commanders can randomize security and ground support operations.

Security forces should randomly practice PNAF security operations on non-PNAF C-130 and C-141 aircraft. Additionally, ground support operations including safety, munitions maintenance, transportation, command post, and tower must support security deceptions and plan their own. For example, safety personnel might identify alternate cargo pads for PNAF aircraft parking or munitions maintenance could load and off-load empty weapon containers. The bottom-line in creating a successful deception is to disorient the terrorists by appearing to be unpredictable. Being successful will require the cooperation of all unit personnel (25:21).

TECHNOLOGY

The role of technology to protect PNAF aircraft against hand-held rockets or missiles during low-altitude flight must address risk and cost (13:212). At risk is the hazard caused by the crash of a PNAF aircraft containing nuclear weapons. There are few cost effective technological countermeasures available to significantly reduce this risk. However, the Air Force is testing the Lockheed-Georgia designed electronic countermeasures (ECM) system to protect C-130 transports against radar and infrared-guided missiles and radar-guided antiaircraft artillery (AAA). The ECM system is called SATIN (Survivability Augmentation for Transport Aircraft - Now).

A four man maintenance team can temporarily install SATIN in eight hours (11:89,91).

SATIN includes existing ECM equipment; the AN/ALQ-156 missile warning radar to detect incoming infrared-guided missiles, the AN/ALR-69 radar warning receiver to detect threat radars related to missiles or AAA, and the AN/ALE-40 chaff and flare dispenser (11:89,91).

Lockheed is also studying a similar system for C-141 and C-5 transports to counter the shoulder-fired missile threat (11:91). The Air Force Scientific Advisory Board recommended outfitting the entire fleet of C-5, C-141, and C-130 with ECM equipment; however, the Joint Electronic Warfare Center believes the cost effective approach is to preposition SATIN kits where the threats are greatest (11:91). I believe PNAF aircraft with Western European missions should have a permanent ECM system. Other PNAF aircraft would receive temporarily installed prepositioned SATIN kits based on current threat conditions. Additionally, there are some cost effective security resources available to reduce smuggling of RPG-7 or SA-7 weapons into Western Europe. Placement of advanced explosives detectors at international airports, seaports, and major border crossings could reduce weapon availability (13:212). Further, advancements in weapons technology could limit the risk of plutonium scatter -- nuclear contamination.

If a PNAF aircraft were destroyed carrying nuclear weapons containing insensitive high explosives (IHE), there would be less risk of nuclear contamination (2:176). This would simplify our response to the crash site and reduce public fears over possible contamination. Commanders of units in high risk terrorist areas should only be provided with nuclear weapons using IHE. Another area of weapons advancement could include research and development of a nuclear safe weapons container. The design characteristic would incorporate known surety features within a highly resilient container capable of withstanding an aircraft crash and prolonged burning without plutonium scatter (2:187).

UNIT PLANS

Absolute protection against terrorist activities is not possible. Protection plans' and procedures must be based on a balance between mission requirements, available manpower and fiscal resources, and the degree of protection required based on the current threat (21:1).

Finally, units must develop specific plans tailored to compensate for their individual locations, missions, and threat conditions (21:1). These plans should contain unit actions to prevent, deter, and respond to terrorist attacks against PNAF aircraft. The U.S. Air Force Office of Security Police (AFOSP) is responsible for developing the security requirements for the logistical movement of nuclear weapons (18:3). However, security's main goal is only to deter hostiles (19:3-1). More comprehensive plans need development. The following discussion of unit plans will highlight only some areas that units should consider in developing their individual plans.

Prevention Planning

The objective of prevention planning is to prevent a successful attack against a PNAF aircraft from terrorists using hand-held rockets or missiles. Specific planning factors include:

- * coordination/cooperation between AFOSI and host national intelligence agencies (14:99);
- * combined host national/U.S. covert intelligence teams to locate terrorists (14:99);
- * unit operational security training concerning PNAF mission data (20:D-7);
- * use of hand-held intrabase radios with communications security devices;
- * conduct random PNAF mission exercises using non-PNAF C-130 and C-141 aircraft;
- * identify alternate cargo pads for PNAF aircraft parking;
- * evaluate weapon design features in high risk terrorist areas (2:187); and,
- * install ECM equipment on PNAF aircraft flying to Western Europe (11:89,91,93).

Deterrence Planning

Security police are responsible for developing security requirements to deter attacks on PNAF aircraft. Deterrence plans must convince terrorists that the risk is unacceptable if they attack (19:3-1). Specific planning factors include:

- * coordination with host national police forces for off-base response actions (19:13-5);

- * provide training to host national police forces in security force tactics (10:61);

- * assist host national police forces in obtaining appropriate weapons and equipment (10:61);

- * randomize security forces' patrol sizes, times, and areas of responsibilities;

- * periodically demonstrate unit security force's firepower through realistic counter terrorist exercises (25:21); and,

- * increase security threat conditions periodically to disorient terrorists (21:1-2).

Response Planning

If prevention and deterrence fail then units must control the accident site. This is the purpose of response planning. Unit agencies of fire, rescue, crash control, disaster preparedness, safety, public affairs, command post, hospital, and ordnance disposal must be prepared to respond. Additionally, coordination with the host government will be extremely important. Specific planning factors include:

- * conduct realistic disaster response exercises based on foreseen accidents (3:111);

- * coordinate unit response plan with host national emergency planning agencies (19:13-5);

- * obtain host government approval for off-base emergency responses (3:112; 19:13-5);

- * determine military explosive ordnance disposal (EOD) and Department of Energy Nuclear Emergency Search Team (NEST) response times (2:398-402);

- * establish combined military and host civilian evacuation teams (3:111);

- * develop and maintain disaster response records on names, addresses, and telephone numbers of local host nationals (government and transportation officials, employers of large numbers of people, heads of local schools, and medical and social welfare personnel) (3:112);

* develop and maintain records on the location and availability of specialized equipment (water purification, auxiliary power, water storage tanks, food warehouses, and heavy earth moving equipment) (3:113); and,

* develop and maintain records on facilities (hospitals, clinics, hotels, schools, churches, warehouses, and public halls) (3:113).

Mr. Bernard O'Keefe, chairman of the executive committee of EG&G, Inc. and principal developer of firing circuits for the first nuclear weapons (3:217), stated:

The best policy [to counter terrorism] would be to ensure that skilled, determined, well-organized terrorist organizations do not exist. If that is not practical, the next best policy would be to dissuade such organizations from making the attempt and to demonstrate that even if the attempt is made and succeeds, it will be counterproductive to the organization's goals and objectives (3:124).

Embodied in Mr. O'Keefe's statement is the essence of developing tailored unit plans employing countermeasures designed to prevent, deter, and respond to a credible threat against a low-altitude PNAF aircraft in Western Europe from terrorists using a small hand-held anti-aircraft rocket or missile.

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